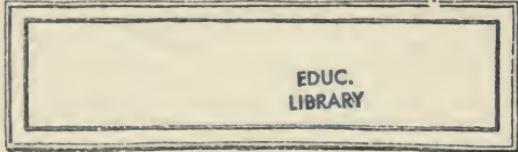
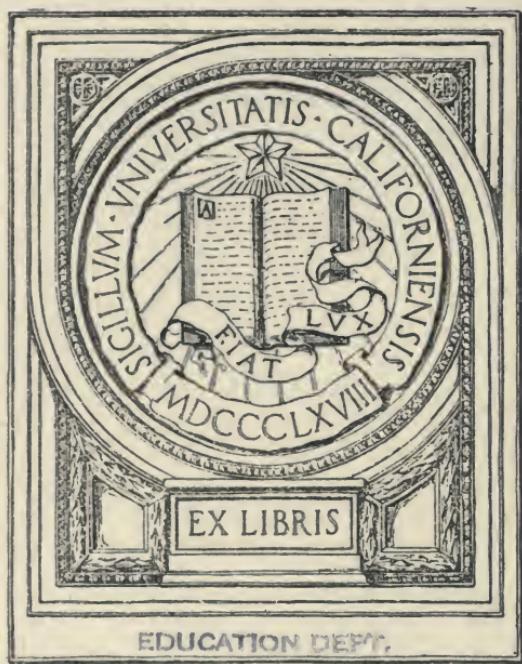


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I. TRAINING OF TEACHERS FOR SECONDARY COURSES IN AGRICULTURE

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Some idea of the present demand for instructors qualified to teach agriculture in secondary schools may be derived from the fact that in the United States at present there are over a hundred special agricultural schools located in 17 different states supported in whole or in part by the states, and that agriculture was taught in 1910, as a separate subject in more or less complete courses, to over 37,000 pupils in 1,800 public and 140 private high schools, according to the reports submitted by these schools to the Bureau of Education. It is true that much of the instruction given in these schools is very elementary and is of an informational rather than a practical character. It is true also that the courses given are very brief in the majority of cases. On the other hand there are fully as many high schools giving four-year courses as there are special agricultural schools and the courses given by them are as vocational in their character as the courses given by the majority of the special schools. California, for instance, has 12 high schools with agricultural departments in charge of special agricultural teachers. All of these schools are supplied with land for instructional purposes varying from 3 to 27 acres in extent; all have available laboratories and several have greenhouses. Michigan has 11 high schools with four-year courses in agriculture, each taught by a graduate of the Michigan Agricultural College. Massachusetts, New York, Nebraska, Iowa, Ohio, Minnesota, Tennessee, and Vermont each has several such schools. One or more may be found in almost every state in the Union.

Of the special agricultural schools and the 2,000 public and private high schools teaching agriculture, only a very few besides the institutions giving four-year courses in the subject have instructors with a college or normal-school training in scientific agriculture, and a large percentage of the active teachers with such training have had no training in psychology or pedagogy. Probably no one factor has had greater influence in retarding the introduction of substantial courses in agriculture in all

high schools whose pupils are drawn in large numbers from farming districts than the shortage of properly qualified teachers. The demand for such teachers is indicated by the numerous inquiries received by the Bureau of Education for information concerning where men may be found qualified to teach agriculture in elementary and secondary schools. President B. I. Wheeler, of the University of California, in a recent letter to the Bureau, writes: "The demand for male teachers in the elementary schools of California is unprecedented. There has come at one and the same time a general desire for well-equipped teachers of science and the additional demand for men particularly equipped in agriculture." President J. A. Widtsoe, of the Agricultural College of Utah, says: "Up to the present a large majority of the graduates of this institution have gone out as teachers of agriculture, home economics, mechanic arts, and related subjects." President J. H. Worst, of North Dakota College of Agriculture, writes: "The demand for such teachers is far and away beyond our ability to supply. This, for the reason that the high schools generally of Minnesota and many in North Dakota are incorporating fairly strong courses in agriculture in the high schools."

It will be several years before the supply of men available as instructors in agriculture will be sufficient to fill the demand. Although the salaries paid are from 50 to 100 per cent higher than paid for instructors in other subjects in secondary schools, the state colleges of agriculture are finding difficulty in persuading men to qualify specially for teaching, because even these salaries are not equal to those paid in the agricultural industries to the graduates of these institutions. It is important, however, that properly trained men be obtained. Agriculture as a high-school science has not yet been developed into good pedagogical form and until such development has taken place a higher grade teacher is needed for the agricultural subjects than for any other subject in the high-school curriculum.

Men for this work need a liberal education in the general cultural subjects, and special training: first, in the physical and natural sciences, particularly in their relation to the science and art of agriculture; second, in technical and practical agriculture and farm practice; third, in rural sociology and agricultural economics; fourth, in general psychology and pedagogy; fifth, in special agricultural pedagogy including the history of agricultural and industrial education, the place and purpose of agriculture in the high school, the function of the agricultural high school,

special methods of teaching agriculture, and other similar aspects of agricultural teaching. The opportunity for such preparation is offered by several of the state colleges of agriculture; the opportunity for a part of such preparation is offered by a large number of these institutions.

There is in each state and territory one college of agriculture and mechanic arts, established under the provisions of the act of Congress of July 2, 1862, commonly known as the Land Grant Act, because by it there was granted to each state a quantity of public land equal to 30,000 acres for each senator and representative in Congress, the moneys derived from the sale of which have formed perpetual endowment funds, the income being used for the support of these institutions. Further aid was provided them by the acts of Congress of August 30, 1890, and March 4, 1907, so that now each state receives from the federal government, not including the income from the act of 1862, an annual appropriation of \$50,000 exclusive of the money paid for agricultural experiment stations. In 17 southern states separate institutions for Negroes have been established and the federal appropriation is divided between the colleges for white students and these institutions.

While the agricultural work of these colleges, until the year 1907, was along technical lines almost exclusively, many of their graduates have become special teachers of agriculture in secondary schools with no other training than their technical agricultural courses and the other subjects in their general college course. More recently has come the demand for men trained specially for teaching, and it was largely in response to this demand that Congress in 1907, in the act for the benefit of state colleges of agriculture and mechanic arts, included the proviso that part of the money "may be used for the special preparation of instructors of the elements of agriculture." This measure is known as the Nelson amendment, as it is contained in an amendment to the appropriation bill for the Department of Agriculture. Under its provisions each state is now receiving for the benefit of its college of agriculture and mechanic arts the sum of \$25,000, included in the \$50,000 mentioned above, all or part of which may be used for the special preparation of teachers of the elements of agriculture. It is held by the Bureau of Education, in whose hands the administration of the federal funds for these institutions is placed, that this language authorizes the expenditure of these funds for providing special courses in agricultural pedagogy but not in general pedagogy.

As a result of the measure 36 of the 50 agricultural colleges, not including the separate institutions for the colored race, now offer some opportunities to their students to fit themselves as special teachers of agriculture for secondary-school work. Twelve institutions offer only certain courses in general education elective to students in agriculture, 14 offer courses in general education and special courses in agricultural education, 1 offers courses in agricultural education only, 7 that have departments of education allow students in these departments to elect courses in agriculture, 9 offer prescribed four-year courses for teachers, and 3 offer special one-year courses to persons preparing to teach agriculture who have already had the equivalent of the general college education. Several others will accept properly qualified persons as special students. The accompanying table gives a list of the state agricultural colleges that are offering special opportunities for preparing teachers of secondary-school agriculture and indicates which plan is followed by each institution.

A description of the special features of the pedagogical training for teachers of agriculture in all of the land-grant colleges cannot be given here. Enough, however, are included to illustrate the character of the courses offered. The institutions selected are from widely distributed parts of the country and include examples of several different methods of arrangement of this special work. The courses and arrangement of the work in the other institutions are for the most part similar to the ones described here. A statement prepared by the writer regarding the work of each land-grant college in the preparation of teachers is given in the chapter on agricultural education in the *Report of the Commissioner of Education*, for 1911.

The University of California recommends for the state teachers' certificates as special teachers of agriculture only students who have completed in their college course 12 semester-hours work in education and at least 27 hours in agriculture and agricultural education. The term semester-hour is used here and in following statements to mean one hour per week for one semester or half-year; a 4 semester-hour course therefore is the equivalent of 4 recitations a week for a semester. Seven distinct courses in agricultural education are offered, two of which only are arranged especially for students preparing for high-school work. "Agriculture in Secondary Schools" is a two-hour course and treats of the

STATE AGRICULTURAL COLLEGES OFFERING SPECIAL
OPPORTUNITIES FOR PREPARING TEACHERS OF
SECONDARY-SCHOOL AGRICULTURE

	Agricultural Students May Elect Courses in General Education	Education Students May Elect Courses in Agriculture	Special Elective Courses Offered in Agricultural Pedagogy	Prescribed Four-Year Course Offered for Teachers of Agriculture	Special One- Year Course for College Graduates Preparing to Teach Agriculture
Alabama Polytechnic Institute, Auburn, Ala.	..	..	X	..	..
University of Arkansas, Fay- etteville, Ark.	X	..	..	..	..
University of California, Berke- ley, Cal.	X	X	X	..	..
Colorado Agricultural College, Fort Collins, Colo.	X	..	..	..	..
University of Florida, Gaines- ville, Fla.	..	..	..	X	..
Georgia State College of Agri- culture, Athens, Ga.	X	..	..	..	..
University of Idaho, Moscow, Idaho	X	..	X	..	..
University of Illinois, Urbana, Ill.	X	..	X	X	..
Purdue University, Lafayette, Ind.	X	..	..	..	..
Iowa State College of Agricul- ture and Mechanic Arts, Ames, Iowa	X	..	X	X	..
Kansas State Agricultural Col- lege, Manhattan, Kan.	X	X	..	..	X
State University, Lexington, Ky.	..	..	..	..	..
Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.	..	X	..	..	..
University of Maine, Orono, Me.	X	..	..	X	X
Massachusetts Agricultural College, Amherst, Mass.	X	..	X	..	..
Michigan Agricultural College, East Lansing, Mich.	X	..	X	..	X
University of Minnesota, Min- neapolis, Minn.	X	..	X	..	..
Mississippi Agricultural and Mechanical College, Agricul- tural College, Miss.	..	..	X	X	..
University of Missouri, Colum- bia, Mo.	X	..	X	..	..
University of Nebraska, Lin- coln, Neb.	X	..	X	..	..

STATE AGRICULTURAL COLLEGES OFFERING SPECIAL
OPPORTUNITIES FOR PREPARING TEACHERS OF
SECONDARY-SCHOOL AGRICULTURE—*Continued*

	Agricultural Students May Elect Courses in General Education	Education Students May Elect Courses in Agriculture	Special Elective Courses Offered in Agricultural Pedagogy	Prescribed Four-Year Course Offered for Teachers of Agriculture	Special One-Year Course for College Graduates Preparing to Teach Agriculture
University of Nevada, Reno, Nev.	×
Rutgers College, New Brunswick, N.J.	×
New Mexico College of Agriculture and Mechanic Arts, Agricultural College, N.Mex.	×
Cornell University, Ithaca, N.Y.	×	×	..
North Dakota Agricultural College, Agricultural College, N.Dak.	×	×	..	×	..
Ohio State University, Columbus, Ohio	..	×	×
Oklahoma Agricultural and Mechanical College, Stillwater, Okla.	×
Oregon Agricultural College, Corvallis, Ore.	×	..	×
Pennsylvania State College, State College, Pa.	×
Rhode Island State College, Kingston, R.I.	×	..
South Dakota College of Agriculture and Mechanic Arts, Brookings, S.Dak.	×
University of Tennessee, Knoxville, Tenn.	×	×	..
University of Vermont and State Agricultural College, Burlington, Vt.	×	..
State College of Washington, Pullman, Wash.	×	..	×
West Virginia University, Morgantown, W.Va.	×	..	×
University of Wisconsin, Madison, Wis.	×	×	×
University of Wyoming, Laramie, Wyo.	×

* Two-year course in nature-study and agriculture.

aims, organization, and methods of agriculture as a high-school subject; "The Practice of Teaching Agriculture" is a graduate course and includes lectures, readings, and conferences, together with school observation and

practice of teaching. A course in the history of agriculture and two courses in farm management, including some work in rural economy, are given in the agricultural college and are recommended especially for students preparing for teaching. The twelve hours in education include the history of education, the principles of secondary education, either educational methods or school management, and the practice of teaching, a graduate course taken in connection with the course in the practice of teaching agriculture.

The University of Illinois, while allowing agricultural students to elect courses in the department of education, offers also a four-year prescribed course for prospective teachers of agriculture which includes 61 hours agriculture, 31 hours allied sciences, 17 hours general cultural subjects, 6 hours in agricultural education, and 8 hours in general education. The work is divided as follows, the figures indicating the number of hours devoted to the subjects:

Agronomy.....	21	Entomology.....	2 $\frac{1}{2}$
Animal husbandry.....	16 $\frac{1}{2}$	Zoölogy.....	5
Dairy husbandry.....	8	English.....	4
Horticulture.....	15 $\frac{1}{2}$	Rhetoric.....	9
Secondary-school agriculture...	6	Economics.....	2
Thremmatology.....	2 $\frac{1}{2}$	Education.....	8
Botany.....	6	Library science.....	2
Chemistry.....	15		

The course in secondary-school agriculture consists of a study of the features of agricultural science best adapted to high-school conditions; the best order and methods for their presentation; suiting the course and instruction to the special interests and needs of each school community; and the planning and execution of laboratory and field work. The courses in education include "the principles of education" and "the principles of secondary education." The essential difference between this course and that offered by the University of California is in the amount of technical agriculture required, the Illinois institution requiring 61 hours work against 25 in California. Illinois gives 6 hours work in secondary-school agriculture, California 2 hours, while in general education Illinois gives only 8 and California 12. It should be noted, however, that part of the required work for the teacher's certificate at the University of California is graduate work, while the courses listed above given at the University of Illinois are all undergraduate.

The University of Maine also offers a four-year prescribed course which includes 50 semester-hours of agriculture, 11 hours education, and 89 hours English, mathematics, sciences, and free electives. The course in education includes 6 hours in the history of education, 3 in the foundations of education, and 2 in child-study. The work in agriculture is all in the last three years of the course and includes agronomy, animal industry, horticulture, forestry, farm management, veterinary science, agricultural chemistry, and bacteriology. The amount of technical agriculture coincides more nearly with that given by the University of Illinois, but at the University of Maine no courses are given to bridge the gap between these courses and the professional courses in education, as is done at the University of Illinois and at the University of California. In other words, the student who has completed the course at the Maine institution must work out his own agricultural pedagogy and methods of teaching.

A better plan is followed by the Massachusetts Agricultural College, where a department of agricultural education was organized by direction of the state legislature in 1907, just before the passage of the Nelson amendment by Congress. The department has but one sort of students to deal with, those preparing to become special teachers of agriculture; therefore it can devote its entire energy to the special needs of these men. Six courses are given by the department, all open as junior and senior electives: general psychology, 3 semester-hours; history and philosophy of vocational education, 3 hours; general methods of teaching and special methods in agriculture, 2 hours; teachers' agriculture, 3 hours; seminar in education, 4 hours. The teachers' agriculture consists of a selection and review of such parts of the technical courses in agriculture, horticulture, and the biological and physical sciences as are adapted to the work of the public schools; the seminar in education is arranged for the special study of such topics as legislation and agricultural education, and the place and value of agricultural science in school courses. A department of rural social science gives 22 semester-hours elective work of special value to men preparing to teach in rural communities: agricultural industries and resources, historical and comparative agriculture, co-operation in agriculture, agricultural economics, and rural sociology. The prospective teacher entering this college takes the prescribed course for the first two years in common with all other students. This includes 10 hours in elementary agriculture and horticulture, 20 hours in physical

and natural sciences, 12 hours in English, 10 hours in mathematics, and 14 hours in French or German. In the last two years 3 hours are required in English and in political science. The student preparing to teach must take all courses in education and electives enough to make at least 17 hours of work each semester. The electives must be taken largely from courses in agriculture, horticulture, forestry, and the closely allied sciences, and from the courses in the rural social sciences. The graduate of this department has had therefore in his four-year course 42 hours in general cultural subjects, 20 hours in physical and natural sciences, 15 hours in agricultural education, and 67 hours electives chosen from courses in technical agriculture, horticulture and forestry, the physical and natural sciences, and the rural social sciences. As the institution is an agricultural college with no mechanic arts college or liberal arts college included, all courses offered are taught from the agricultural viewpoint and closely correlated with the technical work in agriculture.

A prescribed four-year course is offered in the School of Education of the University of Tennessee. The course includes even less agriculture than the University of California, 18 hours of work only being prescribed. This includes courses in agronomy, horticulture, animal husbandry, and dairying. Fifteen hours of work is required in education, the courses including psychology and philosophy, the history of education, and the science and art of teaching. In addition to this arrangement students in the regular agricultural course may elect a few courses in education in their Junior and Senior years.

The University of Missouri was one of the first of the land-grant colleges to make special provisions for men desiring to fit themselves for teaching agriculture. Now provision is made for those intending to become general-science teachers with a small amount of training in agriculture, and for those intending to prepare as special teachers of agriculture. The students in the first of these classes take all their professional work including agriculture in the School of Education; those in the second class take their technical courses in agriculture in the Agricultural College and their professional work in education in the School of Education. The School of Education offers three agricultural courses elective to all students preparing to teach. The "Administration of Agricultural Education" is a course dealing largely with the modern movements and methods in agricultural education from the standpoint of the superintendent of schools. No work in agriculture is a prerequisite. "Soils and Plant Culture," and "Animal Husbandry" are two

courses covering the fundamental principles of these subjects and are arranged for prospective teachers who have had no other courses in agriculture. To secure a life certificate as a special teacher of agriculture candidates must include in their four years' work, in addition to the required subjects in the School of Education, a minimum requirement of 15 hours in agronomy, animal husbandry, and horticulture from courses offered in the Agricultural College for the Bachelor's degree.

Mississippi Agricultural and Mechanical College has organized a "School of Industrial Education" which offers a special four-year course leading to the Bachelor's degree in preparation for teaching agriculture or the mechanic arts. Students receive instruction in the languages, mathematics, history and civics, chemistry, physics, biology, geology, psychology, history of education, logic, ethics, sociology, besides technical courses in agriculture given in the department of agriculture. A course called "A Study of the Agricultural High School" is offered for advanced seniors and graduate students. This course attempts to give the student a true conception of the kind of education the agricultural high school is intended to provide, and a full understanding of the service it is to render the community at large. It attempts also to give the student a practical knowledge of the most approved methods of scientific agriculture. A model farm connected with the School of Industrial Education is conducted to illustrate the proper function of the agricultural high-school farm. The institution is developing a one-year post-graduate course which will include work in general and agricultural education designed to fit its students for filling positions as principals of agricultural high schools. The study of the agricultural high school will be continued, and the men will be given practical work on the "model agricultural high-school farm" and practical teaching in the working boys' course offered by the college. This additional year's work is very desirable for men intending to teach, because the college is obliged to accept in its undergraduate courses a large number of men who have not had the advantage of a complete high-school course.

Several of the land-grant colleges have made provisions for prospective teachers of agriculture properly qualified in other respects to become special students in agriculture or agricultural education. The Michigan Agricultural College allows graduates of other recognized colleges and of state normal schools who have had at least two years' experience in teaching to select technical courses in agriculture, entering with regular

classes and taking the subjects in the same manner and at the same time as the regular students. The courses selected may be from those given in any year of the college course, but must be approved by the classifying officer. A similar opportunity is offered by the Kansas Agricultural College. The University of Maine offers a prescribed one-year course open to college graduates, high-school teachers with at least two years' experience, and normal-school graduates who have taught at least three years. The course includes agricultural botany, 2 hours; agricultural chemistry, 4 hours; agricultural economics, 2 hours; elementary veterinary science, 5 hours; economic entomology, 2 hours; bacteriology, 1 hour; agriculture, 34 hours; horticulture, 15 hours; forestry, 2 hours; school gardening, 1 hour; and education, 2 hours.

The work in agriculture in the normal schools is intended in all but a few cases as preparation for the required work in the elementary schools. Agriculture is a required subject in the common schools of 12 states, and in the rural schools of 5 others, and is required for teachers' certificates in 14 states. This has forced it into the curriculum of the normal schools of the states where the subject is required and has aided in its inclusion in the curriculum of normal schools in other states. During the past year agriculture as a separate subject, in more or less complete form, was taught in 104 state normal schools and in the 24 county training schools of Wisconsin. Many of these institutions have graduates of agricultural colleges for instructors in agriculture. The majority offer brief courses extending from 4 to 12 weeks. Many offer a full year's course and a few a course of greater extent.

The State Normal School at North Adams, Mass., offers a three-year course in agriculture as well as shorter courses in school and home gardening, agriculture, horticulture, and nature-study. The work is arranged and conducted with the co-operation of the State Agricultural College, which has for the past three years added to the faculty of the normal school an instructor and supervisor who has given a portion of his time to instruction at the normal school and to supervision at its three training schools, a second portion to the promotion of elementary agriculture and nature-study in the schools of Berkshire County, in which the normal school is located, and the remainder to instruction at the college in agricultural education. The three-year agricultural course includes all of the work in English, psychology, and pedagogy included in the regular two-year normal course. A graduate of the regular normal course, or a

college graduate, may take the agricultural work given in the three-year course in one year. The work is intended to prepare special teachers of agriculture for supervisory work or for teaching in secondary schools. It includes the following courses:

I. AGRICULTURE—Soils. Plant life, structures, functions, and diseases. Fertilizers, tillage, crops. Hotbeds, cold frames, and greenhouses. Farm live stock, poultry, bees. Dairying.

Horticulture—Flower and shrub gardens. Window gardens. Propagation, pruning, and cultivation. Orchards and small fruits. Forestry.

Insects and birds—Economic importance. Control of injurious insects.

Farm buildings and machinery.

Sanitary science.

(Agricultural physics and chemistry involved in preceding topics.)

Rural social science.

II. NATURE-STUDY—Its content and relation to science, literature, and vocational work.

III. MANUAL TRAINING—Carpentry, cabinet work, forge work, assembling farm machinery.

Drawing—Free-hand and mechanical, structural and decorative design, use of color, farm and building plans.

IV. ENGLISH, etc.

V. PEDAGOGY AND PSYCHOLOGY.

The Fourth District State Normal School at Springfield, Mo., offers two elementary courses and one advanced course. The elementary courses together extend through five terms five hours a week, and include a study of plant life, soils and soil fertility, farm crops, grain judging, enemies and diseases of plants and their control, crop rotation, feeds and feeding, live stock, poultry, dairying, and general farm management. The advanced course is a two-year course and includes one term's work in each of the following: dairying, animal husbandry, orcharding, farm management, poultry raising, and gardening. The institution has established a two-year agricultural high school in which the students devote one-fourth of the time to agriculture or domestic science, and one-eighth of the time to pedagogy as applied to rural-school teaching. The course is intended to prepare young men and women for rural-school work, and graduates will receive a state teacher's certificate to teach in rural schools. The institution owns a model farm and good equipment for agricultural instruction. The instructor in agriculture is a man trained especially for teaching that subject.

The State Teachers College of Colorado, at Greeley, maintains a department of agricultural education offering nine courses. The work is arranged especially for rural teachers, and a special diploma in elementary agriculture is given to students completing the course. The institution is equipped with a farm, nursery, gardens, greenhouse, and stables. The instructor is a graduate of an agricultural college. The courses given by the department are as follows, each being a sixty-hour course: Nature-study; elementary agriculture; school gardening; soils and crops of the farm; animals of the farm; dairy industry and poultry husbandry; horticulture on the farm; the farm home; and rural sociology and the rural school.

Among separate institutions for the colored race two are offering excellent opportunities to prepare for teaching agriculture in secondary schools—Hampton Normal and Agricultural Institute at Hampton, Va., and Tuskegee Normal and Industrial Institute at Tuskegee, Ala. The Hampton Institute offers a three-year vocational course in agriculture and a special one-year course to students who have completed the vocational course and are preparing to teach agriculture. The one-year course includes the chemistry of soils, manures, and fertilizers; chemistry of dairy products; fermentation; milk testing; geology in its relation to soil formation; biology in its relation to plant and animal life; farm engineering, including a study of farm machinery and structures; and farm physics, including soil physics, the relation of the atmosphere to agriculture, climatology, and the organic life in the soil and air. Students taking this course are required to take also the teaching course in the training school where they are required to teach classes in agriculture under a critic teacher. Upon the completion of both courses they receive a special diploma.

At Tuskegee students in the agricultural department preparing to teach may elect a Junior year course in elementary psychology in its relation to teaching and a Senior course in the history of education and methods of teaching. These courses in education may be taken as post-graduate work by students who have completed the undergraduate work at Tuskegee or its equivalent elsewhere.

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